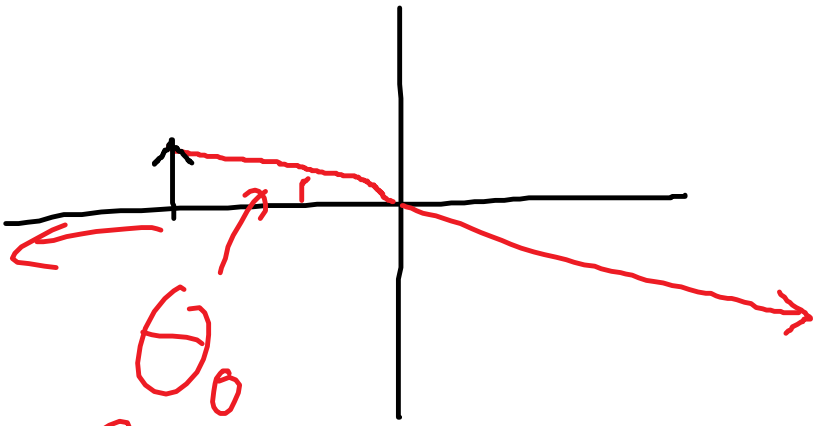
Imaging
Power of lenses, P
Angular Magnification, M
Near point, Far point

Power $P=1/f$ in units of diopters, $D=1/m$

eg. Erica has lenses with a 4.0 diopter power, they are convex (positive) and focal length 0.25m $P=1/f$

recall, linear magnification, $m=h_i/h_o = -v/u$

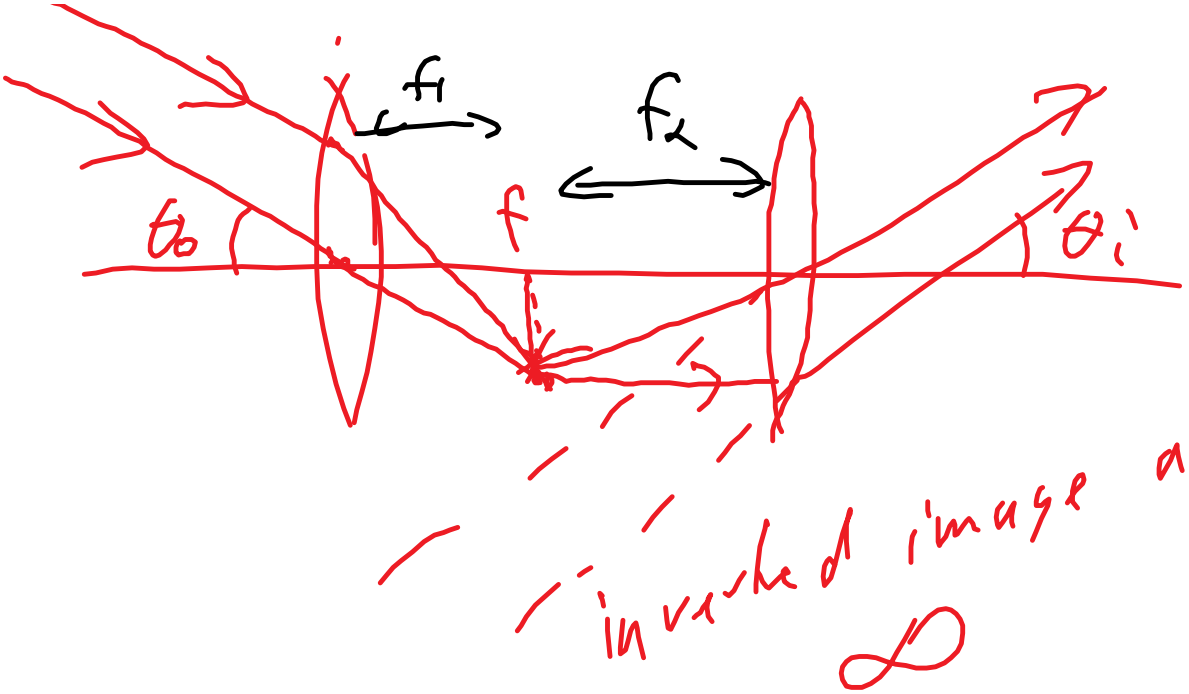
angular magnification, $M=\theta_i/\theta_o$



θ_o

for objects far away $v \to \infty$

θ_i = angular size of the image



$$m = -v/u$$

$$m_T = m_1 \times m_2$$

$$m_T = -f_1/u_1 \times -\frac{v_2}{u_2}$$

$$m_T = \frac{f_1}{\infty} \times \frac{\infty}{f_2}$$

$$m = \frac{f_1}{f_2}$$

telescope - lab

Near point - The closest point your eye can still focus comfortably. Symbol for the near point distance is D.
(not to be confused with the symbol for dipoter, D)

D or the book uses (curvy d) for power, IB uses P.
IB - say the standard near point is about 25cm.

Far point - is the furthest point you can still focus comfortably.
Most people have a far point of infinity. Near sighted people, have a non-infinity far point.

Two lenses that touch, the power of the lenses add together for the total power.
$P = P_1+P_2$ (Hecht uses curvy Ds)

P904 problems 38, 41, 51, 57, 61, 63,
p906 86, 87

For Q73 - the radius of curvature of a spherical mirror is about 2xf=c f=c/2
1/f = 2/c = 2/100

Spherical aberration - image gets distorted around the edge of a spherical mirror - good mirrors are parabolic instead of spherical.

Chromatic aberration - image gets distorted in a lens because different colours have slightly different indices of refraction - rainbow.
correct by using parabolic mirror, instead of a lens.

big lenses are also expensive and their weight distorts the shape or even crack.